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ABSTRACT

This study evaluated the effects of using the Edmark Reading Program, Level 1, to develop sight-word vocabulary in first graders at risk for reading failure. This program is a highly structured approach based on providing explicit, direct instruction that is intensive, focused, and not of brief duration. The 62 students receiving the intervention attended three schools with high numbers of economically disadvantaged students in rural Louisiana and were selected as being in the 20-30 percent of students most at risk for reading disabilities. Half of the students received 15 minutes per day of one-on-one tutoring using the Edmark program by volunteer college students. Control group students were read to aloud in small groups for an equal amount of time. The study found that one-on-one tutoring using the Edmark Reading Program was successful in increasing the sight word vocabulary and comprehension skills of the students. (Contains 36 references.) (DB)

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The Effects of Structured One-On-One Tutoring in Sight Word Recognition of First Grade Students At-Risk for Reading Failure

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The Effects Of Structured One-On-One Tutoring In Sight

Word Recognition Of First Grade Students

At-Risk For Reading Failure

The problem of functional illiteracy in the United States is enormous in scope. One-fourth of all 17-year-olds still in school read below the level needed to read simple popular magazines; 14% have already dropped out of school by age 17 (Slavin, Karweit, & Madden, 1989). The primary reasons students report for dropping out are school-related, such as poor performance or reading difficulties; personal reasons (such as pregnancy) are second, with economic reasons cited third (Garcia, 1991). The reading disability problem is chronic and pervasive; under even ideal circumstances, reading disabled children do not usually catch up with their non-disabled peers, and many actually become worse over time (Aaron, 1997; Cunningham & Stanovich, 1998; Stanovich, 1986; Torgesen, 1998). Longitudinal studies show that 74% of students identified in third grade as reading disabled remain this way through ninth grade, even after receiving special education services (Lyon, 1996). Researchers are calling for an end to special education labeling of children, and instead, the provision of specialized reading instruction for all who need it (Aaron; Allington & McGill-Franzen, 1990; McCormick & Becker, 1996). The goal of early intervention with all children displaying poor reading skills is to prevent their failure in school, as well as their referral to special education.

The traditional methods for dealing with non- or poor readers have included grade retention, ability grouping, special education placement, and Title I pull-out programs; many researchers believe these approaches have been equally ineffective (Allington &

McGill-Franzen, 1990; Robinson, 1992; Slavin et al., 1989). While programs such as Reading Recovery (Clay, 1979) and Success for All (Slavin, Madden, Dolan, & Wasik, 1996) have been successful with many students at-risk for reading failure (Gaffney, 1993; Pinnel, Lyons, DeFord, Bryk, & Seltzer, 1994; Ross, Smith, Casey, & Slavin, 1995; Slavin et al., 1996), their cost is often prohibitive to school districts (Gettys, 1994; Shanahan & Barr, 1995). Vadasy, Jenkins, Antil, Wayne, and O'Connor (1997b) have pointed out that individual tutoring is beyond the financial means of most schools, yet it is most often the intervention of choice for students in need of special assistance.

A significant point of agreement in the literature is the acknowledgment of the Matthew Effect and the resulting call for early intervention (Aaron, 1997; Spear-Swerling & Sternberg, 1994; Uhry & Shepherd, 1997). The Matthew Effect refers to the rich-get-richer, poor-get-poorer phenomenon in which good readers become more and more motivated to read, get more practice reading, are expected to achieve more, and acquire additional cognitive skills through the process of frequent reading (Spear-Swerling & Sternberg). Despite the need for early identification and intervention, most school districts do not identify learning disabled students until they are reading well below grade level; in most cases, identification takes place in grades 3 to 6 (Lyon, 1996; Vadasy, Jenkins, Antil, Wayne, & O'Connor, 1997a). This does not have to be the case, however, as students with reading disabilities can be identified much earlier (Uhry & Shepherd, 1997). Finally, the majority of reviewed articles appear to agree on two issues: (a) reading disabled children require explicit, direct instruction that is intensive, focused, and not of brief duration; and, (b) early identification and intervention could possibly prevent reading disabilities, or at least reduce their magnitude.

The purpose of this study, therefore, was to investigate the effects of using an economically feasible sight word training program as a supplementary intervention with first grade students at-risk for reading failure. Using a highly structured approach and an errorless discrimination method, the *Edmark Reading Program* (1992), Level 1, is designed to develop a 150 sight-word vocabulary in beginning or disabled readers. The *Edmark Reading Program* has traditionally been used with special education students (Conners, 1992; Vandever & Stubbs, 1977; Walsh & Lamberts, 1979) and the literature contains no report of its use with non-special education students. Based upon the researcher's 13 years of experience using the *Edmark Reading Program* with learning disabled, mentally retarded (mild/moderate), and autistic students, as well as information discovered in a review of applicable literature, it was hypothesized that the *Edmark Reading Program* could benefit at-risk first grade readers.

While the majority of the literature agrees that phonemic awareness and mastery of phonetic decoding skills are ultimately required for successful reading, it was hypothesized that such skills take years to develop in some at-risk readers (Lovett, Warren-Chaplin, Ransby, & Borden, 1990; Uhry & Shepherd, 1997). The majority of the researcher's former special education students in first through third grade who possessed poor phonemic awareness and phonetic decoding skills were able to develop functional sight word vocabularies using the *Edmark Reading Program*. These sight word vocabularies allowed students to become readers and maintain passing reading grades while their phonemic awareness and phonetic decoding skills developed over the course of several years. It was thus hypothesized that children identified as being at-risk for reading failure could benefit from the *Edmark Reading Program*'s approach by acquiring a sight word

vocabulary sufficient to prevent or decrease reading failure and special education referral, and to permit interaction with text while phonetic skills developed over the long term. The one-on-one tutoring given in this study by volunteers could be replicated in elementary schools in an economically feasible manner using volunteers, teacher aides, or peer tutors, as use of the program requires only two hours of training and the ability to read and verbally reinforce students. The *Edmark Reading Program* itself can be purchased for $475. After initial purchase of the nonconsumable kit, only response booklets must be purchased at an annual per pupil expenditure of $2.19.

Theoretical Framework

This study was based on the consensus in the literature that reading disabled children require explicit, direct instruction that is intensive, focused, and not of brief duration (Swanson, 1999). The mastery learning involved in the intervention was based on the work of John Carroll and Benjamin Bloom. In "Mastery Learning," his 1971 adaptation of that work, Bloom maintained that approximately 95% of students can learn subjects taught in the public schools to a high level of mastery, given sufficient learning time and appropriate types of help. Bloom believed that brief diagnostic tests should serve as formative evaluation, and knowledge of progress should be given to students as reinforcement. The *Edmark Reading Program* (1992), in which each student works at his or her own pace, tests each 10 words presented, and students receive immediate feedback after each response and each test. Bloom (1977) viewed one of the important effects of mastery learning as its positive outcome on students' self-concepts. Because no one is judged as frequently at any other point in his or her life as in school, children who experience failure often experience a systematic destruction of their self-concepts. Bloom

believed that children's feelings of inadequacy in school, corroborated by failing grades, would result in negative views of school and learning itself, and ultimately, to negative self-concept and impaired mental health. Conversely, Bloom proposed that providing success experiences for children through mastery learning strategies could provide a type of "immunization against mental illness" (1977, p. 197). It was thus hypothesized that if the intervention were to prevent reading failure in experimental group participants, it was also possible that their views of reading in particular and school in general could be improved.

Null Hypotheses

In order to determine the effects of one-on-one tutoring in sight word recognition on the reading performance of first grade students at-risk for reading failure, the following null hypotheses were tested:

Hypothesis 1: There is no statistically significant difference in the level of word recognition, as measured by the Word Identification subtest of the Woodcock Reading Mastery Tests-Revised, between the experimental group and the control group.

Hypothesis 2: There is no statistically significant difference in the level of word recognition, as measured by the Level 1 Posttest of the *Edmark Reading Program*, between the experimental group and the control group.

Hypothesis 3: There is no statistically significant difference in the level of reading comprehension, as measured by the Passage Comprehension subtest of the Woodcock Reading Mastery Tests-Revised, between the experimental group and the control group.

Hypothesis 4: There is no statistically significant difference in the level of letter identification, as measured by the Letter Identification subtest of the Woodcock Reading Mastery Tests-Revised, between the experimental group and the control group.

Hypothesis 5: There is no statistically significant difference in the level of phonetic decoding, as measured by the Word Attack subtest of the Woodcock Reading Mastery Tests-Revised, between the experimental group and the control group.

Research Questions

The following research questions were addressed by analyzing the qualitative data collected during the study:

Research Question 1: Will a pattern of responses concerning the reading performance of first grade students identified as being at-risk for reading failure emerge from interviews with key informants (students, parents, teachers, principals and assistant principals) for experimental and control group students?

Research Question 2: Will a pattern of responses concerning the attitudes toward reading of first grade students identified as being at-risk for reading failure emerge from interviews with key informants (students, parents, teachers, principals and assistant principals) for experimental and control group students?

Research Question 3: Will a pattern of responses concerning the attitudes toward school of first grade students identified as being at-risk for reading failure emerge from interviews with key informants (students, parents, teachers, principals and assistant principals) for experimental and control group students?

Research Question 4: Will a pattern of responses concerning the attitudes toward self of first grade students identified as being at-risk for reading failure emerge from interviews

with key informants (students, parents, teachers, principals and assistant principals) for experimental and control group students?

Methodology

Sample

The sample for the study was purposefully selected in order to determine the 20 to 30% of the target population (first graders) most at-risk for reading disabilities. The population from which the sample was drawn were entering or repeating first grade students in three public elementary schools in a rural north Louisiana school district. These schools contained the greatest percentage of students receiving free lunches in the town (85%, 74%, and 59%) ("Our Schools," 1999). All three schools were further identified as Title I schools, in which all students received computer-assisted instruction in reading and math in Title I computer laboratories. Principals and teachers were asked to identify the bottom 20 to 30% of first grade readers based upon student scores on kindergarten reading tests, teacher observation, and student scores on the Developmental Reading Assessment (DRA) (Beaver, 1997), which is given at the beginning of the year to all elementary students in the state to determine if they are on, above, or below level in reading.

Instrumentation

The quantitative data in the study were obtained from the following sources:

1. Pre-test scores on the following subtests of the *Woodcock Reading Mastery Tests-Revised* (WRMT-R), Form G (Woodcock, 1987): (a) Letter Identification, (b) Word Identification, and (c) Word Attack.

2. Posttest scores on the following subtests of the *Woodcock Reading Mastery Tests-Revised*, Form H (Woodcock, 1987): (a) Letter Identification, (b) Word Identification, (c) Word Attack, and (d) Passage Comprehension.
3. The number of words read on the posttest of the *Edmark Reading Program* (1992), which consisted of reading a list of 150 individually presented words taught in Level 1 of the program.

The *Woodcock Reading Mastery Tests-Revised* (Woodcock, 1987) are a battery of individually administered reading tests surveying several components of the act of reading, which are appropriate for student levels ranging from kindergarten through college senior (Cooter, 1989).

Qualitative data were collected in the form of field notes kept during the treatment period (August/September 1999 through January 2000), review of documents such as report cards, and interviews with key informants. Field notes focused on weekly observations by the researcher of the one-on-one tutoring and group reading sessions in each school. Interviews were conducted with the following key informants: (a) parents of participating students, (b) regular education teachers of participating students, (c) participating students, and (d) the principals and assistant principals of the participating schools. The interviews were conducted: (a) before the intervention began (kindergarten teachers, students, principals and assistant principals), and (b) at the conclusion of the intervention in January and February 2000 (parents, first grade teachers, students, principals and assistant principals).

Procedural Details

The 62 students in the three participating elementary schools who were purposefully selected by their principals and teachers as being at-risk for reading failure were administered three subtests of the WRMT-R (Letter Identification, Word Identification, and Word Attack) at the beginning of the 1999-2000 school year. The students, their kindergarten teachers from the previous school year, as well as their principals and assistant principals were interviewed by the researcher. Students were then randomly assigned to either a control or an experimental group at each school. Experimental group students received 15 minutes per day of one-on-one tutoring in the *Edmark Reading Program* for the first semester of the 1999-2000 school year. Tutoring was administered by America Reads volunteers who were not certified teachers, but were education majors from a local university who received financial aid for tutoring reading in the local public schools. The six American Reads tutors were trained for two hours either individually or in small groups by the researcher in the use of the *Edmark Reading Program.* Control group students were read to aloud in small groups for 15 minutes per day for the first semester by the same volunteer tutors in order to partially control for the Hawthorne Effect. Two control group students were lost to attrition during the study, resulting in 60 participants at posttest. Participant gender, repeater status, and school are shown in Table 1.

At the conclusion of the first semester, all participating students were posttested by an external examiner on the following measures: four subtests of the WRMT-R (Letter Identification, Word Identification, Word Attack, and Passage Comprehension) and the *Edmark Reading Program* list of 150 words taught in Level I, which students were asked

Table 1: Participants by Gender, Repeater Status, and School

School A	N	Male	Female	Repeaters
Control	14	8	6	4
Experimental	16	10	6	8
School B				
Control	5	3	2	2
Experimental	5	4	1	0
School C				
Control	10	7	3	1
Experimental	10	7	3	2
Total Study				
Control	29	18	11	7
Experimental	31	21	10	10

to read aloud. At the end of the intervention, the researcher conducted interviews with the participating students, their first grade teachers, principals, and assistant principals, as well as their parents or guardians, and first semester report cards were examined as supporting documentation.

Limitations

Limitations of the study included the problem of statistical regression, which is common when subjects are selected for extremely low test scores. Students in the study were selected for scoring in the bottom 20-30% of students in their grade level in reading. The small sample size was another significant limitation. The study initially included 31

experimental and 31 control group students; two control group students were lost to attrition. Selection of the sample was purposeful, rather than random, and because this selection was done by principals and teachers, their adherence to selection criteria could not be documented. An additional limitation was the first grade teachers' awareness of students' status as experimental or control group participants, as experimental group students left their classrooms one at a time for tutoring, while control group students left in small groups. Because the students were also aware that two different groups existed, the John Henry Effect could have been an additional confounding variable.

While the Hawthorne Effect was partially controlled for by reading to control group students, the number of America Reads volunteers available precluded control group students being read to one-on-one. If ample volunteers had been available, the control group could have been taught the 150 *Edmark* words using another instructional method. Another limitation was the lack of validity and reliability data on the Developmental Reading Assessment (DRA), which was given to all students by the participating schools. This assessment can only be seen as having "field validity," as the participating school system determines if elementary students are below, on, or above reading level by administering this assessment at the beginning of the school year.

Finally, the bias of the researcher after using the *Edmark Reading Program* for 13 years should be noted. To partially control for such bias, an external examiner, unaware of students' experimental or control group status, administered all posttests. In addition, the qualitative data concerning student attitudes toward reading, school, and self which were gathered in the study were based upon subjective reports by key informants; no attitudinal instruments were used.

Data Analysis

In order to analyze the quantitative data collected in this study, stepwise multiple regressions were performed to determine the significance of the relationship between variables other than the independent variable (*Edmark* treatment) and the dependent variables (the five posttests administered to participants). Variables considered were Pretest Scores, Repeater Status, Grade Repeated, and Gender. The variables explaining the greatest part of the variability in posttest scores were then considered as covariates in the five univariate analyses of covariance (ANCOVA) in order to increase statistical power and reduce bias. The alpha level for significance was set at $p<.05$. The ANCOVAs were used to test the null hypothesis that the control and experimental groups represented random samples from populations with the same means (Harris, 1998). Finally, Cohen's *d*, or effect size (Kenny, 1987), was calculated to determine how much the treatment effected the five posttest standard scores.

The qualitative data were analyzed as collected in the form of field notes and interviews (Bogdan & Biklen, 1992). Such data were coded into recurring categories or themes. Content analysis was used to identify, code, and categorize primary patterns in the data collected (Patton, 1990). Data were cross-validated for accuracy by analyzing observations during the treatment sessions, interviews with key informants, and review of documents, such as teacher reports, comments, and grades on student report cards.

Results of Analysis of Quantitative Data

For Hypothesis 1, the WRMT-R Word Identification Pretest Standard Scores and Grade Repeated were used as covariates in the univariate analysis of covariance (ANCOVA) of the WRMT-R Word Identification Posttest Standard Scores. The resulting

F value of .602 was not statistically significant at the .05 level. Null Hypothesis 1, predicting no significant differences between control and experimental groups on this dependent variable was accepted. Calculation of Cohen's *d* yielded an effect size of .19, which is small, and therefore supported the result of no significant difference between control and experimental group means on the Word Identification Posttest.

For Hypothesis 2, DRA Pretest Scores which were obtained for each child by his or her classroom teacher before implementation of the intervention were considered as a possible covariate, as no pretest scores were available for the *Edmark* word list. A bivariate correlation was performed on the DRA Pretest data and *Edmark* Posttest scores; results of the Pearson Correlation showed the two measures to be significantly correlated at the 0.05 level (2-tailed), thus justifying the inclusion of the DRA Pretest data in the stepwise multiple regression. Because the regression analysis indicated that the DRA Pretest could be used to predict the *Edmark* Posttest scores, the DRA Pretest was used as a covariate in the univariate analysis of covariance (ANCOVA) of the *Edmark* Level 1 Posttest scores. Results of the analysis of covariance are shown in Table 2, and adjusted post-mean determinations are shown in Table 3. The resulting F value of 44.10 was statistically significant at the .05 level. Null Hypothesis 2, predicting no significant differences between control and experimental groups on the *Edmark* Posttest scores was not accepted. Calculation of Cohen's *d* yielded an effect size of 1.2, which is extremely large, and therefore helped explain the treatment effect in the program.

Table 2: One-Way ANCOVA of Edmark Posttest Scores by Group

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	44394.67	2	22197.34	26.16	.000	.479
Intercept	27277.45	1	27277.45	32.14	.000	.361
DRA Pretest	10364.11	1	10364.11	12.21	.001	.176
GROUP	37426.64	1	37426.64	44.10	.000	.436
Error	48375.06	57	848.69			
Total	753430.00	60				
Corrected Total	92769.73	59				

Table 3: Adjusted Posttest Means of Edmark Posttest Scores

Group	Pretest	Posttest	Adjusted Mean	F
Control*				
M	8.07	80.13	78.99[a]	
SD	2.71	38.06		
				44.10
Experimental**				
M	7.55	127.97	129.20[a]	
SD	2.73	24.62		

a. Evaluated as covariates, appeared in the model: DRA Pretest = 7.80.
*n = 29
**n = 31

For Hypothesis 3, Repeater/Nonrepeater Status was used as a covariate in the univariate analysis of covariance (ANCOVA) of the WRMT-R Passage Comprehension Posttest Standard Scores. Results of the analysis of covariance are shown in Table 4, and adjusted post-mean determinations are shown in Table 5, using DRA scores as pretests.

Table 4: One-Way ANCOVA of WRMT-R Passage Comprehension Posttest Scores by Group

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	3159.75	2	1579.87	9.24	.000	.245
Intercept	71472.53	1	71472.53	417.98	.000	.880
REPEATER	2382.48	1	2382.48	13.93	.000	.196
GROUP	1034.37	1	1034.37	6.05	.017	.096
Error	9746.84	57	171.00			
Total	462707.00	60				
Corrected Total	12906.58	59				

Table 5: Adjusted Posttest Means of WRMT-R Passage Comprehension Posttest Scores

Group	Pretest	Posttest	Adjusted Mean	F
Control*				
M	8.07	82.86	82.27[a]	
SD	2.71	16.51		
				6.05
Experimental**				
M	7.55	90.06	90.62[a]	
SD	2.73	12.24		

a. Evaluated as covariates, appeared in the model: Repeater/Nonrepeater Status = 1.28.
*n = 29
**n = 31

The resulting F value of 6.05 was statistically significant at the .05 level. Null Hypothesis 3, predicting no significant differences between control and experimental groups on the Passage Comprehension subtest was not accepted. Calculation of Cohen's *d*

yielded an effect size of .49, which is medium, and therefore helped to explain the treatment effect in the program.

For Hypothesis 4, WRMT-R Letter Identification Pretest Standard Scores and Grade Repeated were used as covariates in the univariate analysis of covariance (ANCOVA) of the WRMT-R Letter Identification Posttest Standard Scores. The resulting F value of 3.42 was not statistically significant at the .05 level. Null Hypothesis 4, predicting no significant differences between control and experimental groups on this dependent variable was accepted. Calculation of Cohen's *d* yielded an effect size of .14, which is small, and therefore supported the result of no significant difference between control and experimental group means on the Letter Identification Posttest.

For Hypothesis 5, no models were generated by the stepwise multiple regression analysis, and therefore no variables were used as covariates. An analysis of variance (ANOVA) was used to examine WRMT-R Word Attack Standards Scores. The resulting F value of .01 was not statistically significant at the .05 level. Null Hypothesis 5, predicting no significant differences between control and experimental groups on this dependent variable was accepted. Calculation of Cohen's *d* yielded an effect size of .03, which is considered nonsignificant, and therefore supported the result of no significant difference between control and experimental group means.

Results of Analysis of Qualitative Data

Research Question 1 asked if a pattern of responses concerning the reading performance of first grade students identified as being at-risk for reading failure would emerge from interviews with key informants (students, parents, teachers, principals and assistant principals) for experimental and control group students. Pre-intervention

interviews with students' 1998-1999 school year teachers revealed a majority of students who entered first grade weak in reading and who had attained only the minimum skills required for promotion. Interviews with school principals and assistant principals revealed expectations that study participants would make D's and F's in reading on their report cards, and post-intervention interviews revealed that none of the administrators were aware that some of these at-risk students (15 in all, or 25% of the participants) had achieved their schools' Honor Rolls during the intervention period.

The first grade teachers of participating students did, however, describe significant improvements in the reading ability of 17 experimental group students and 8 control group students. The teachers attributed these gains to such factors as the tutoring program, small group instruction, their teaching, home support, maturity, and medication for ADHD. Seventeen of 20 experimental group parents interviewed also perceived improvements in their children's reading ability, as did 9 of the 13 control group parents interviewed. Parents attributed these improvements to the tutoring program, what the schools were doing, and their working with their children at home. A pattern of responses did emerge from teacher and parent interviews which suggested a number of experimental and control group students had improved significantly in reading ability, with approximately twice as many significantly improved students in the experimental group as compared to the control group.

Research Question 2 asked if a pattern of responses concerning the attitudes toward reading of first grade students identified as being at-risk for reading failure would emerge from interviews with key informants (students, parents, teachers, principals and assistant principals) for experimental and control group students. Interviews with

participants revealed almost every student had a positive attitude toward reading both before and after the study. Pre-intervention interviews revealed 58 out of 60 participants liked to read; the most common reasons why were the belief that reading is fun, and it helps you learn and pass to second grade. Fifty-nine students described positive attitudes towards reading in their post-intervention interviews. All 60 students responded that they enjoyed their reading class in the pre-intervention interviews; 58 still enjoyed their reading class at the end of the first semester.

First grade teachers revealed that 17 experimental group students and 2 control group students had improved attitudes in reading since implementation of the intervention. They attributed these positive changes to the tutoring program, having the importance of reading reinforced in both tutoring and their classrooms, and the students' having obtained skills which made it possible for them to read. Parents/guardians also reported improved attitudes toward reading: 17 experimental group parents related positive changes, as did 7 control group parents. Parents and guardians attributed the improved attitudes to their children being able to read better, and thus enjoying it more.

The interview data thus indicated students self-reported positive attitudes towards reading from the beginning of the school year, while teachers and parents perceived significantly improved attitudes for many students. Both parents and teachers reported more experimental group children than control group children as exhibiting improved attitudes towards reading.

Research Question 3 asked if a pattern of responses concerning the attitudes toward school of first grade students identified as being at-risk for reading failure would emerge from interviews with key informants (students, parents, teachers, principals and

assistant principals) for experimental and control group students. All 60 participants reported they liked school at the beginning of the school year; at the completion of the semester all but one student again verified enjoyment of school. While recess was the most-cited favorite aspect of school, reading and learning were the second and third most mentioned favorites.

The first grade teachers who were interviewed saw significant improvement in attitude toward school in five experimental group and two control group students; one control group student was reported as having a significantly worse attitude. The teachers attributed the improved attitudes to such factors as improved grades and increased self-confidence. The one worse attitude was attributed to the control group child's academic failure. Parents described more positive changes in students than the teachers; 6 of the 20 interviewed experimental group parents saw positive improvements in their children's attitudes toward school, as did 3 of the 13 interviewed control group parents.

While the principals of Schools A and B believed the majority of participants were frustrated by school and did not enjoy it, the principal of School C confirmed that the participants were excited about learning. Data from interviews with participants and key informants thus supported the conclusion that several participating students exhibited significant improvement in their attitudes toward school, and the number of experimental group children reported as improving was greater than the number of control group students.

Research Question 4 asked if a pattern of responses concerning the attitudes toward self of first grade students identified as being at-risk for reading failure would emerge from interviews with key informants (students, parents, teachers, principals and

assistant principals) for experimental and control group students. The interviewed first grade teachers mentioned eight experimental group students in whom they had noticed improved attitudes towards self, and two control group students with lowered self-esteem. The teachers attributed the positive changes to increased language development and the tutoring program, while the decreased self-esteem was explained by academic failure.

Eleven of the 20 interviewed experimental group parents/guardians reported seeing a positive change in their children's attitudes toward themselves, as did 8 of the 13 interviewed control group parents. Parents attributed these positive changes to such factors as increased self-confidence due to being able to read better and achieving Honor Roll status. Once again, interview data supported the conclusion that several participants exhibited significantly improved attitudes toward self, and the number of experimental group students was again greater than the number of control group students. The review of documents further supported this conclusion, as 15 students identified as being at-risk for reading failure by their teachers and principals at the beginning of the school year had achieved Honor Roll status by the end of the first semester.

Discussion and Conclusions

This study demonstrated that the *Edmark Reading Program*, which had previously only been studied with children with mental retardation, could successfully be used to increase the sight word vocabulary and comprehension skills of at-risk first graders. The study also demonstrated the efficacy of utilizing volunteer America Reads tutors to implement the program, rather than certified teachers. The low cost of program implementation, coupled with its effectiveness, could make the replication of the study feasible for other school systems with limited financial resources. While the effect size of

the intervention on the WRMT-R Word Identification subtest was small (.19), the effect size for WRMT-R Passage Comprehension was moderate (.49), and for the 150 *Edmark* posttest words, large (1.2). In comparison, the average effect size for one-on-one tutoring programs with at-risk first graders is .40 (Cohen et al., 1982). The qualitative data collected in the study revealed significant improvement in more experimental than control group students on reading ability, as well as attitude toward reading, reading class, school, and self. Participant interviews also revealed positive attitudes on the part of students toward reading, reading class, and school, supporting the need to prevent deterioration of such attitudes because of reading failure.

Based upon these results, it is recommended that schools which are not financially able to implement effective yet expensive programs such as Reading Recovery and Success for All should consider tutoring for first grade students at-risk for reading failure using the *Edmark Reading Program*. While previous research has proven its efficacy with children with mental retardation, this study lends support to its effectiveness with at-risk first graders. In addition, schools should consider utilizing paraprofessionals or volunteers to implement such a program. The key to success in utilizing non-certified tutors appears to be matching the program implementation requirements to the skills of the tutor. In the case of the *Edmark Reading Program*, its highly structured format allows successful implementation by non-certified volunteers. Schools wishing to implement a supplemental tutoring program should also investigate the possibility of utilizing America Reads volunteers. These volunteers are usually college students who tutor reading at no charge to the school in exchange for financial aid from their college or university. This study supported the effectiveness of using *Edmark's* errorless discrimination method to teach a

150-sight word vocabulary with at-risk first graders. It is possible that this method could be used to teach students other selected vocabulary lists. Finally, schools which teach reading using a purely phonetic approach should consider teaching sight words as a supplementary intervention for students with low phonemic awareness and phonological decoding skills. This study supported the special education principal of building on strengths while remediating weakness, and this principle should be considered in the teaching of at-risk students.

In order to better control for the Hawthorne Effect, replications of this study should provide one-on-one tutoring in another subject area to all control group students. Because of the small number of participants in this study, it should be replicated with a greater number of first graders in geographically and economically diverse schools before its results can be generalized to all first graders at-risk for reading failure. In order to determine the intervention's impact on grade retention and special education placement, participants should be followed through third grade. Such long-term follow-up could also provide data on the long-term benefits of the program in terms of both academic achievement and attitudes toward reading, reading class, school, and self. Finally, further research should be conducted to determine which children would benefit most from the *Edmark* intervention. Since no program works with all students, it would be advantageous to identify the academic and testing profile of students who would exhibit the greatest gains using a sight-word training program. Such information could also have implications for the most effective instruction of these students in the regular classroom.

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